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ABSTRACT

Many researchers have assumed that adult bilinguals have separate systems for their two languages. Such an assumption raises interesting questions about how the two languages are acquired in the case of a child learning two languages simultaneously. This study attempts to determine whether the two languages are acquired separately right from the beginning or whether at first they form a single system and only become separated at a later point. A phonological analysis is presented of a Romanian-English bilingual child's spontaneous speech at age two, and the processes operating in the two languages are compared. Specifically, sound inventories, segmental substitution patterns, final consonant deletion, deletion of unstressed initial syllables, cluster reduction, glottal stop insertion and the insertion of weak vocalic segments were examined in both languages. Since the same phenomena were found to occur in both English and Romanian, it is concluded that there is only one system through which both languages are being processed at age two. (Author)

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One System or Two - An Analysis of a Two-Year-Old Romanian-English Bilingual's Phonology

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1. Introduction

The bilingual child discussed in this paper, Eileen, is the daughter of a Romanian mother and English father, both university professors. At the time of the study, the family was living in a university community, where Eileen's mother was teaching. The language used in the home was mainly Romanian, although Eileen's older brother almost always used English. American baby-sitters, with whom Eileen spent several hours a day, were her major source of English. At age two, Eileen's two languages appeared to be quite evenly balanced.[1]

The data analyzed in this study come from a corpus of spontaneous speech recorded by Eileen's mother at the end of May 1974, just after Eileen's second birthday.[2] In the tapes, totalling one and a half hours recorded over a period of three days, Eileen was interacting with her mother most of the time, while dressing, feeding, and playing. Eileen's father and brother were also present at times.

I transcribed the tapes quite closely, making use of many of the ideas and symbols suggested in the Working Paper of the Stanford Child Language Project (Bush, Edwards, Luckau, Stoel, Macken and Petersen 1973). In the final analysis, however, many of the diacritics specifying place and manner of articulation (e.g. dental vs. alveolar, flat vs. grooved) were not indicated since these variations were quite random and did not seem to make any difference in my interpretation of the data. For example, when [t] appears, it refers to dental as well as alveolar varieties of the stop, and to apical as well as to blade articulations.

2. Bilingualism - One System or Two

It has often been assumed that adult bilinguals have two linguistic systems (e.g. Weinreich 1968). A question that arises from this position concerns the manner in which the two systems are acquired. Are they acquired separately right from the beginning? Or do they form a single system until some later point and then split into two? This study of Eileen's phonology at age 2;0 was undertaken in order to determine whether her Romanian and English represented two separate systems or a single combined one.

A number of studies of bilingual children have suggested that in the earliest stages one system is used for both languages. Leopold (1939) reported that Hildegard, at age two, had one system for her German and English, which she began to slowly separate during her third year. Burling (1973) found that his bilingual son, as late as 2;10, had a single predominantly Garo phonology through which he processed both Garo and English. Chao (1973), in observing his granddaughter at 2;4, also found that she used a single phonological system. Her Chinese and English were both processed through a predominantly Chinese phonology. Similar findings were also reported for Georgian and Russian by Imedadze (1967) and for French and English by Swain and Wesche (1973). Although all of these studies discuss the question of one or two systems in bilingual children, it is only a peripheral issue. The present paper is focussed directly on this question in an attempt to provide systematic evidence in support of either one or two initial systems.

At 2;0, Eileen's speech seemed to have an undifferentiated system at the lexical level. There appeared to be no patterns for her choice of Romanian or Enlgish vocabulary items. Words were used regardless of addressee, preceding utterance, or topic of conversation, unless Eileen had a particular word in only one language and her choice was limited in that way. For example, she used both sus 'up' and jos 'down' interchangeably with down, and Romanian cîine interchangeably with English dog. Many of her utterances of more than one word were composed of Romanian and English. For example, apa ('water') there, and go to nani ('sleep').

If Eileen did, in fact, have a single phonological system for both languages at the time of investigation, one would expect that the words of Romanian and English origin would be treated in the same way, undergoing the same processes. If, on the other hand, each language had its own system, one would expect to find certain processes in one which did not appear in the other. I therefore looked at areas that one might expect to be different because of certain differences between adult Romanian and English; I also looked for any other patterns that occurred in words in only one of the two languages.

3. About Romanian

In order to be able to compare Eileen's Romanian and English, a brief description of standard adult Romanian phonology is necessary.

Figure 1 is a traditional phonemic representation of the consonants found in Romanian, all of which may appear in initial position. Of interest are the facts that /k/ and /g/ have the regular positional variants [tʃ] and [dʒ][3], respectively, before /i/ and /e/, and that [x]

and [h] are in free variation as allophones of the phoneme /h/, /ts/ and /ʒ/ commonly appear initially in Romanian though only very marginally in English, and the English /θ/ and /ð/ are completely absent from Romanian.

Insert FIGURE 1 about here

Figure 2 is a representation of the Romanian vowel phonemes. A special aspect of Romanian vowels is the devoicing rule /i/ → [i̥] /C_#, where C ≠ /l, r/. This [i̥] often has the effect of palatalizing the preceding C[4]. Romanian, like English, has a schwa, but the two are very different entities. Whereas in English the appearance of [ə] is predictable, depending on the features of stress and tenseness of the vowel (Chomsky & Halle 1968), the same is not true in Romanian where [ə] appears independently of stress and tenseness: The reduction of English vowels to [ə] also depends to some extent on certain performance factors such as "speed, casualness, frequency of use of the item, predictability in a particular context, etc." (Chomsky & Halle 1968: 110). No such flexibility is allowed in Romanian, where the difference between [ə] and [a] is constrastive (e.g. [masə] '(a) table' vs. [masa] 'the table').

Insert FIGURE 2 about here

4. Phonological Evidence for One or Two Systems

PHONETIC DIFFERENCES

Certain phonetic characteristics of comparable Romanian and English sounds differ in the two languages. The presence in Eileen's speech of a difference in point of articulation of what are alveolar consonants in

in English and dentals in Romanian would constitute evidence for two separate systems, as would the use of aspiration with English voiceless stops but not with Romanian ones.

What showed up in Eileen's speech for the features of aspiration and dental versus alveolar articularion, however, was simply random variation in both languages. There were aspirated stops in Eileen's Romanian as well as in her English (e.g. [apʰa] and [apa] apa 'water'; [kʰukʰi], [kuki], [kukʰi] and [kʰuki] cookie) and dental articulations in her English as well as in her Romanian (e.g. [da] and [d̪a] da 'yes'; [ʔa dʒɛ] and [ʔa d̪ʒɪɛ] right there). This finding lends support to the one-system hypothesis.

PHONOLOGICAL PROCESSES

In addition to the presence or absence of a given feature in Romanian or English, analysis of the various processes operating in Eileen's production of words in the two languages can also provide evidence to support one or the other hypothesis. It is important to look at processes rather than sound inventories since simple lists yield no information about the relations between the adult model sounds and those of the child. In fact, simple inventories may even be misleading. For example, if Eileen had a [Φ] in both her Romanian and English inventories, it would be wrong to equate them if it turned out that the Romanian one came from an /f/ in the model and the English one from a /p/.

segmental substitution patterns

In analyzing Eileen's substitutions, some very striking patterns appeared. The most noticeable was the extreme similarity in her treatment of the Romanian and English initial consonants.

The ranges of initial consonant phonemes of the words Eileen had

learned in the two languages were very similar. Figures 3 and 4 show the adult initial consonant phonemes found in the models of Eileen's vocabulary. Of the possible initial consonants in Romanian, Eileen did not have tokens in this corpus representing /ts, dʒ, z, l, r/, and of the English possibilities, she was missing /dʒ, v, z, θ/.

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insert FIGURES 3 and 4 about here

To some extent, the gaps are due to the limitations of the corpus, since Eileen definitely had at least one word with the English initial /dʒ/ in the model, juice, though it did not occur in thiscorpus. Eileen actually had examples of all the initial Romanian sounds found in the models for her speech, except [ʒ] (cf. Figure 5), but they did not necessarily correspond to the same sound in the adult model. A similar situation existed for her English, where all the initial sounds of the model items, except [ð] and [r] appeared, though not necessarily in direct correspondence to the sounds of the adult forms.

Although the initial sounds in Eileen's speech may have corresponded to many, or even to most of the initial sounds in the adult models, they cannot be considered phonemes in the same way since it is not clear that they were used consistently and contrastively as in the adult languages. In fact, it is clear that some of the sounds were not so distinguished. For example, Eileen at times used [ʃ] and [s] where they corresponded to the adult forms in shoes and sit down, [ʃɪʊʃ] and [sʊdæ̃n], but she also used [s] for the adult /ʃ/ and [j] for /s/, in the same words [sɪʊs] and [ʃɪ dæʊ̃n].

In addition to those sounds that Eileen used that are also used in the standard languages, there were other sounds that she used that are not normally part of the adult repertoires. Her variation of aspirated and non-aspirated stops meant that when a stop was aspirated it was extra-systemic for Romanian, although it was perfectly acceptable for English; the reverse held in the case of dental articulations of /t/. There was also a wide range of variation in the groove of /ʃ/, but this, as well as the aspirated/non-aspirated and dental/alveolar features, represented random variation in production and did not account for different units in this analysis.

On the other hand, however, I decided that such sounds as [ɸ,β,ç, x] deserved to be considered significant units in Eileen's speech because they appeared to be more than just randomly produced variants of model sounds. [ɸ] and [β] are interesting since they maintained a systematic voice/voiceless distinction, that is,[ɸ] always came from voiceless models and [β] from voiced ones. The [ç]was considered a separate phone in this analysis rather than a variety of /s/ or /ʃ/ because it appeared to separate the two for Eileen. [ç] was substituted at times for the adult /s/ in her speech but never for /ʃ/, although both [s] and [ʃ] were each substituted for the adult /s/ and /ʃ/. The [x] was considered a significant unit since it is so common in Romanian as a variant of /h/, but is not a target in English at all. The fact that [x] appeared as a substitute for /h/ in English as well as in Romanian indicates that Eileen was treating her English /h/ models in the same way she treated the Romanian /h/.[5] Figure 5 contains an inventory of sounds that appeared to be significant in Eileen's speech, either because they were similar to adult phonemes and therefore seem most likely to serve as the foundations

of the adult systems, or because they seemed to be significant units in Eileen's own system.

The consonant substitutions in both languages fell into two clearly separable categories, stable and unstable sounds. The former consists of those adult consonants that were consistently reproduced in Eileen's speech and the latter consists of those consonants which varied in the way the adult model was represented by Eileen. These substitution patterns appear in Figures 6 and 7.

It is perhaps to be expected that the stops and nasals were, on the whole, more stable than the fricatives and liquids. Other findings were not so predictable. For example, the adult /tʃ/, a sound usually acquired rather late in English, was stabilized quite early in both Eileen's English and Romanian vocabularies. A similar pattern of early development of /tʃ/ has been reported for Spanish by Macken (1975). The early development of the /tʃ/ could be due, in part, to its high frequency in Romanian (as in Spanish), and consequently its availability for use to the child. The fact that Eileen stabilized /tʃ/ in English as well as in Romanian is further evidence for the existence of a single phonological system since the more likely early acquisition of the sound in Romanian was apparently extended to English.

The absence of a voice/voiceless contrast in the dental stops in Eileen's speech was at first quite puzzling since the voicing distinction had already been acquired in sounds one would expect to be stabilized later than /t/ and /d/. A possible explanation is that both Romanian tati and English daddy were used in the home to refer to the same person. Since the main difference between the two terms is the voice feature of the consonants, the semantic element may have clouded the need for a contrast

for Eileen, thus delaying her acquisition of the distinction between /t/ and /d/[6].

Where /ð/ went to [n] in Eileen's speech, it was due to a process of assimilation. That is, ð --> n / n#_. For example, pune ('put') there was articulated as [pun neə].

insert FIGURES 6 and 7 about here

final consonant deletion

At first glance, the final consonants appeared to be behaving differently in the two languages. It seemed that the deletion of final consonants was quite common in English words, but rather infrequent in Romanian words. Upon closer examination, however, the cause of this difference became clear. There were simply not very many instances of consonants occurring in final position in the adult versions of the Romanian words Eileen had learned, whereas there were many more in her English words.

The numerous vocalic inflectional endings and number and gender suffixes in Romanian result in a relatively small percentage of words ending in a consonant, unlike English. In Romanian, even the -ul suffix for the singular masculine definite article, written with a final consonant, is usually pronounced as [u]. Thus, of Eileen's 85 Romanian vocabulary items in this corpus, only 12 ended in a consonant in the adult form. Of her 70 English words, 44 ended in a consonant. These numbers do not include clearly onomatopoetic forms such as brrbrr.

The following are examples of the deletion process:

jos 'down' → [tʃɔis] or [dʒɔɪ]

shoes → [ʃɪʊʃ] or [tʃu][7]

Rather than representing different processes and therefore different linguistic systems, the difference in the number of deleted final consonants in Eileen's Romanian and English reflected a difference in the phonological distribution patterns of the two languages.

deletion of unstressed initial syllables

Another strategy which at first appeared to disconfirm the one-system hypothesis was the deletion of an unstressed initial syllable since it seemed to apply only to Romanian words. Once again, upon closer examination, the limitation by language of this phenomenon was found to be due not to the existence of two systems, but rather to the nature of some internal difference between Romanian and English. The process operated in words of the form (C)V(C)CV́CV(C), of which there were thirteen exemplarsin Eileen's Romanian vocabulary, and only one in her English, the rest being stressed on the first syllable. This process, then, applied regardless of language to the appropriate forms, but there was only one English token eligible in Eileen's vocabulary. The following are examples of the deletion process:

another --> [nɪ́hʊ]

maşina 'the car' --> [ʃína]

prosopul 'the towel' --> [sépʊ]

After the weak initial syllable is deleted what appears is a new initial consonant. These 'neo-initial' consonants, for the most part, behaved in the same way as the 'real initial' consonants. Figure 8 shows the similarity in the substitution patterns when compared to those shown in

Figures 6 and 7. The only striking difference is the occasional substitution of [n] for /m/ in the 'neo-initials'. This only happened, however, in the word lumină ('light'), where there was an assimilation to the point of articulation of the nasal in the next syllable (m --> n / __VnV).

Insert FIGURE 8 about here

cluster reduction

Cluster reduction, a common process in child speech, was also found in Eileen's speech. This process, operating on the clusters in both the Romanian and English words, provided further evidence for a single phonological system. Most of Eileen's clusters were composed of a stop or fricative followed by a liquid. The liquid was deleted and the remaining consonant was a fricative if the original one had been a fricative, or a stop if the original had been a stop. Voicing was not necessarily kept constant, and at times, labio-dentals were replaced by bilabials, this last substitution paralleling the [f] / [Φ] alternation invoiving singleton consonants (see Figures 6 and 7). In clusters composed of a sibilant plus a stop, the result was an affricate. On the whole, however, clusters were rare in the adult models of the words in Eileen's repertoire. This may be the result of selective listening strategies used by the child (Ingram 1973). Figure 9 shows the cluster reduction patterns.

Insert FIGURE 9 about here

glottal stop insertion

Another process which took place in both Eileen's English and Romanian was the optional insertion of a glottal stop before an initial vowel. This rule must be ordered in relation to the substitutions of initial consonants so that when an initial C --> Ø in a particular word, that word too, is

eligible for the optional glottal stop insertion.

Rule 1: C--> Ø / #__V

Rule 2: (optional) Ø --> ʔ/ #__V

These rules can account for such alternations in Eileen's speech as:

uite ('look') --> [wɪtɛ] ~ [ɪtɪ] ~ [ʔɪtɪ]

look --> [lɪk] ~ [ʊk] ~ [ʔɪk]

initial insertion of a weak vocalic segment

Finally, an interesting but puzzling phenomenon in Eileen's speech was the frequent use of a weak vocalic segment before initial consonants. The segment could be any vowel with optional nasalization, and seemed to be subject to the optional Rule 2 above, since it was sometimes preceded by a glottal stop and sometimes not. There did not appear to be any pattern whatsoever in determining vowel quality, nasalization, or the presence of a glottal stop.

In an earlier corpus, collected in March 1974, the set of these weak initial segments was just coming in and was limited almost uniquely to the environment before nouns. At that time, I hypothesized that it was the beginning of Eileen's article system, but by May, these little segments had become quite ubiquitous, appearing not only before nouns, but also before verbs and adverbs.

A simple, purely phonological, rule could be offered where Ø --> V /#__C, but this would not be very satisfying by itself since it would not specify any value for the V and it appears to be in contradiction to the process of weak syllable deletion mentioned above. Since there is no one pattern that clearly accounts for the vowel prefixing, it may be that there are actually several different strategies involved at the same time. Some of the possible explanations include the development of

articles, prepositions and personal pronouns, attention-getters, emphasis makers, and "fillers" used by Eileen to make her speech sound more like the adult speech she was hearing.

The appearance of similar prefixed vowels has also been reported by Grégorie (1947) for French, Macken (personal communication) for Spanish and Weeks (1974) for English. In fact, Weeks discusses the phenomenon in detail and offers many of the same explanations as those suggested above.

5. Conclusions

The analysis of Eileen's phonology revealed a number of linguistic processes. These processes were examined very closely with the intention of discovering evidence for either the one-system or the two-system hypothesis of very young bilinguals' treatment of their two languages. The evidence unquestionably supports the former. Many of the processes discussed above obviously applied to both languages in the same way, and even those that at first glance appeared to offer support to a theory of two systems, upon closer examination, could be better explained by distributional facts of the two languages, rather than by two separate systems at age 2;0.

FIGURE 1. Standard Romanian Consonant Phonemes

	Bilabial	Labio-dental	Dental	(Pre-) Palatal	Velar	Laryn-geal
PLOSIVE	p		t		k	
	b		d		g	
AFFRICATE			ts	tʃ		
				dʒ		
FRICATIVE		f	s	ʃ		h
		v	z	ʒ		
NASAL	m		n			
LIQUID			l	r		
GLIDE	w			j		

FIGURE 2. Standard Romanian Vowel Phonemes

	MID	CENTRAL	BACK
HIGH	i	ɨ	u
MID	e	ə	o
LOW		a	

FIGURE 3. Initial Consonant Phonemes Found in the Romanian Models of Eileen's Vocabulary

p		t		k
b		d		g
			tʃ	
	f	s	ʃ	h
			ʒ	
m		n		
w			j	

FIGURE 4. Initial Consonant Phonemes Found in the English Models of Eileen's Vocabulary

p		t			k	
b		d			g	
			tʃ			
	f	s	ʃ			h
	ð					
m		n				
w			j			
		l	r			

FIGURE 5. Significant Sounds in Eileen's Speech

p		t		k		
b		d		g		
			tʃ			
			*dʒ			
ɸ	f	s	ʃ	ç	†x	h
β						
m		n				
w				j		
		**l				

* sound found only in Eileen's Romanian words in this corpus but also heard on other occasions in English

** sound found only in Eileen's English words in this corpus

† sound found only in Eileen's English in this corpus but also heard on other occasions in Romanian

FIGURE 6. Substitution Patterns: Initial Consonants of Romanian Models--> Initial Consonants of Eileen's Speech

STABLE SOUNDS	UNSTABLE SOUNDS
p --> p	t -->t, d
b --> b (occasionally β)	d -->d, t
k --> k	f -->f, h, Φ
g --> g (occasionally ɣ)	s -->s, ʃ, ç, h
m --> m	ʃ -->ʃ, s, tʃ
n --> n	ʒ -->ʃ, dʒ, tʃ
tʃ --> tʃ	w -->w, ø
h --> h, *x	
j --> j (occasionally ø)	

* phone not recorded in this corpus but heard on other occasions

FIGURE 7. Substitution Patterns: Initial Consonants of English Models --> Initial Consonants of Eileen's Speech

STABLE SOUNDS	UNSTABLE SOUNDS
p --> p	t --> t, d
b --> b (occasionally β)	d --> d, t
k --> k	f --> f, p, Φ
g --> g	s --> s, ʃ, ç
m --> m	ʃ --> ʃ, s, tʃ
n --> n	*dʒ --> tʃ
tʃ --> tʃ	h --> ɦ, x, ∅
j --> j	ð --> d, t, n
	w --> w, ᵝw, ∅
	l --> l, w, ∅
	r --> w, ∅

* in token not recorded in this corpus but heard on other occasions

FIGURE 8. Substitution Patterns of 'Neo-initial' Consonants

p --> p

b --> b

k --> k

n --> n

m --> m (occasionally n)

s --> s, tʃ

ʃ --> ʃ

FIGURE 9. Consonant Cluster Reduction

Rule A: C L --> C
[αcont] [αcont]

ROMANIAN

fl --> Φ

pl --> p^w

kl --> k, g

br --> p^h

vr --> β^w

ENGLISH

fl --> f

pl --> p

tr --> $t\int^w$ (where /tr/ is considered an affricate, as in train)

Rule B: C C → C
sib stop affric

ROMANIAN

sp --> b^β

∫t --> t^ς

∫k --> t^s

FOOTNOTES

1. I recently visited Eileen's family, in December 1974, and found that a great change had taken place. Eileen's English grandmother was now living with the family and Eileen had consequently begun using English to the almost total exclusion of Romanian.
2. The corpus analyzed in this paper is the last one collected as part of a longitudinal study begun in November 1973, when Eileen was 1;6. Unfortunately, this corpus does not include tokens of all of Eileen's words because it was recorded over such a short period of time. Where necessary for the completeness of the analysis, I have included other words Eileen was using by 2;0; if they had been recorded in other tapes or if I had heard and made notes of them myself. These items are indicated as such when used.
3. Although [tʃ] and [dʒ] alternate regularly with [k] and [g], these affricates have been considered separate phonemes in traditional descriptions of Romanian (Augerot 1974: 10). Rather than considering them as /k/ and /g/ with positional variants [tʃ] and [dʒ] derived by special rules as a generative approach does (Ruhlen 1973), the traditional approach appears to be the most appropriate analysis in terms of child language. It is highly improbable that a two-year-old would have recognized the phonological alternation involved.
4. The actual pronunciation of this unstressed final vowel ranges from a reduced to a voiceless vowel, and it is sometimes lost completely (Augerot 1974: 20).

5. There were no tokens in Eileen's Romanian vocabulary with [x] in the present corpus (see Figure 5), but based on my own observations, I have included it in the analysis of the /h/.
6. Moskowitz (unpublished) proposes a similar type of explanation of the relatively late acquisition of the /s/~/z/ distinction in English where children might be confused by the apparently free variation of /s/ and /z/ at the ends of nouns, possessives and third person singular verbs.
7. This cannot yet be considered a singular-plural distinction.

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APPENDIX: Eileen's Vocabulary

A. Romanian Vocabulary†

Adult Model	Eileen's Word
1. acolo 'there'	1. [aka, əkɔ, ʔəkʊ]
2. acul 'the pin'	2. [ᵖækʰu, ʔakʰɨ, æ:ku]
3. Ada - name for brother	3. [a:ɡaʰ, a:ðə]
4. aeroplanul 'airplane'	4. [pænɨ, ʔə̃ɸə̃:hi]
5. afară 'outside'	5. [fa, ʔəfavə, ɸæʊ, ɸɛ:ʔɪ]
6. aici 'here'	6. [ats, ɨtʃ, ɪtʃᵊ, ᵃitʃ]
7. alifie 'slave'	7. [ofie]
*8. am '(I) have'	8. [ə̃m, æm, ə̃, æp]
9. apa 'water'	9. [ʔapa, apa, ʔapʰa, æ:pʰ]
10. aşa 'so' 'like this'	10. [ʔəʃᵃa, əʃa, ɪʃæ]
11. avionul 'airplane'	11. [ʔannβ̃:, ʔɛ̃ũnu, wānũ, vønə]
12. ăsta 'this'	12. [ʔætˢə, ʔæ:sə, ʔata]
13. baie 'bath'	13. [bʰaɪ, ba:ɪ, ba:ɪʰ]
14. bani 'bath room'	14. [bani, banɪ, banɪ̃]
15. bărbie 'chin'	15. [bi:ə, bɪ:ə]
16. bărbiţa 'bib'	16. [βɪtˢə̃, pɨtə, pʰɪ:tʃ]
17. brr-brr - motion sound = 'let's go'	17. [br:br:]
18. buba 'sore'	18. [βubu]
19. buff - dog noise	19. [bᵊuf]
20. caca - child's word	20. [kaka, kʰækʰə]
21. casă 'house'	21. [kasə, ka:sa, kadʒa, kæʃa, kʰʌsa, kʌza]
22. cazi jos 'fall down'	22. [kɛɛhʊt, kazəɣə]'
23. cin-cin 'cheers' (a toast)	23. [tʃɪtˢɪn, tʃɪti]
24. cîine 'dog'	24. [kʰina, kinə]

Adult Model	Eileen's Word
25. copii 'children'	25. [p^hi, $ʔəpi:$]
26. da 'yes'	26. [$d̪a$, da, $d^æ$, dæ, da:, da^h]
*27. dansează 'dance'	27. [$tɬæʒɪ$]
*28. dau 'I give'	28. [dɒ, $d^ju:$]
29. dinți 'teeth'	29. [$t^sɪtʃi$]
30. doi 'two'	30. [$dɔ^i$]
31. Eileen - own name	31. [a-i]
32. eu 'I'	32. [jo, ^ɪjo]
*33. faci 'make, do'	33. [$fət^ə$, $fɐɪtʃ$, fət]
34. fătiță 'little girl'	34. [p^hitsa, $pi:sa$]
35. floare 'flower'	35. [$ɸo$, $ɸɛɪ$]
36. frig 'cold'	36. [$f^ʷig^h$]
37. frumos 'pretty'	37. [$mɔʃ$, $m^ʷɔʃʌ$, $mɔt^s$]
38. gata 'enough'	38. [$gæt^ə$]
39. gură 'mouth'	39. [gua, gʊa, $g^hʊə$]
**40. hai 'come in'	40. [hɔɪ, $xaɪ$]
41. ham 'dog' child's word =small animals	41. [ha:m, ham]
42. (în) brațe '(in) arms'=hold	42. [$p^hætʃ^hɪ$]
43. jos 'down'	43. [$ʃɔɪs$, $tʃɔis$, $dʒɔɪ$]
44. kiț-kiț - name of toy	44. [kiçkiç]
45. kix 'dirty'	45. [$kɪ^x$, $k^hə$]
46. lumină 'light'	46. [nin:ə]
47. mamă 'mommy'	47. [mama, mæmə]
48. masă 'table'	48. [masa, mʌsə]
49. mașină 'car'	49. [ʃɪnə, tʃi:n, ʃɔnə, ʃĩnã, ʃinə, mɔçi, $^dʒɪnə$, $ʔəʃi:nə$, $p^hɪʃɪ:nə$, ^əsɪn]
50. mărul 'the apple'	50. [mʌu, mʌdə]

Adult Model	Eileen's Word
51. meu 'mine'	51. [mæu, mju, m:ə, ma]
52. mică 'little'	52. [bi:tə]
53. na 'here (take, give)'	53. [n̪æ, næ, na, nã]
54. nani 'sleep'	54. [nani, nanɪ, næni, nænɪ, n̪ãnɪ]
55. nasul 'the nose'	55. [nasu, næʃu, næsu, nɛsɪ]
56. nina - lullaby word	56. [ni˞na˞]
57. nu 'no'	57. [nu, nə, nu, n̪^{ə}u]
58. ochi 'eyes'	58. [ok^{h}i]
59. omul 'the man'	59. [^{ʔ}ʌmʌ, əmõ:, ^{ʔ}ʌmu]
60. pantoful 'the shoe'	60. [ɪtʌhu, pɪtʌfu]
61. papa 'food'	61. [papa]
62. papusă 'doll'	62. [puʃa, puʃæ, pu^{t}ʃa, p^{h}əpu]
63. pasăre 'bird'	63. [pasə]
64. patul 'the bed'	64. [pa:tu, p^{h}at^{h}u, pakə]
65. pipi - child's word	65. [pipi, p^{h}ip^{h}i, pipɪ]
66. prosopul 'the towel'	66. [sɛpu]
67. pui 'put'	67. [p^{w}ɪ, p^{w}ə, p^{w}ɛ:]
68. pui 'chicken'	68. [puɪ]
69. pyjama 'pyjama'	69. [p^{h}jə, jæ^{w}ɛ]
70. rochiță 'small dress'	70. [kitʃa, kæ:tʃ]
71. școală 'school'	71. [t^{s}oa]
72. șosete 'socks'	72. [sɛ:ʈ^{h}ɛ, tʃɛtə, tʃ^{j}ɛtɪ]
73. Sorin(o) - brother's name	73. [swi, ʃ^{w}ɔn, ʃ^{w}ɔ̃nʊ, ʃ^{j}ʊ̃no, swɔnu]
74. sticluță 'bottle'	74. [kɨtsə, kʊtsə, guʃɪ]
75. sus 'up'	75. [sɪs, ʃɪʃ, ʃɪʊs, çɪ:s, ʃɪtʃ]

Adult Model	Eileen's Word
*76. s-auzit 'heard'	76. [ç^{j}uɪt]
77. talc 'powder'	77. [t̪æʊ, t^{j}u, tʃ^{j}ʊ]
78. tati 'daddy'	78. [tæt^{h}i, ^{t}ɦæt^{h}i, tætɪ, tæti, tæt̪i, t^{h}æt^{h}i, t̪æt̪ɪ]
79. trenul 'the train'	79. [tʃ^{w}ɛɛ̃, tçɔno, ^{w}enɔ]
80. tu 'you'	80. [tʊ, dʊ]
81. udu 'wet'	81. [ʔʊdə, ʊd, ʊd^{w}]
82. uite 'look'	82. [ɨtɛ, ɪtɪ, ɪdɪ, ^{h}ɪt̪ɪ, ʔidzɪ, wɨḍə, wɨtɪ, ^{w}ɪdə]
83. unu 'one'	83. [ʊnu, ^{ɛ}unʊ, unu]
84. uța 'swing'	84. [judza, uḍa, ^{w}uʦə]
*85. vrei 'want'	85. [βɥɛɪ]

† The forms listed here are representative, though by no means all, variations of each token.

* When person, number and tense are indicated in verb forms, this does NOT mean that Eileen is aware of these elements, but rather that she has chosen a particular form to represent an entire verb.

** Forms not in this corpus but observed by experimenter on other occasions.

B. English Vocabulary†

Adult Model	Eileen's Word
1. all gone	1. [ɔ̃gg̃ãn, oʷgɔ̃n]
2. another	2. [nɪhu]
3. baby	3. [bebɪ, bebi, bebɪʲ, bɛbɪ, bɛᶻbɪʲ]
4. bad boy	4. [babɔɪ, baˀbɔ:]
5. bottle	5. [ba:u, ba:tɪ, baɪ]
6. bus	6. [bʌ:ʰs]
7. bye-bye	7. [babaˀ, βaba]
*8. (I) can't	8. [kiɛ̃, kʰɪ̃:ts, əkɛ̃ᶻtˢ, ˀãkɛ̃:ᵗ, haɪkɛ̃ɪnt]
9. car	9. [gɔ̃, go]
10. chair	10. [tʃiɛ]
11. choo-choo	11. [tˢɪtʃu, tʃɪtʃʉ, ʃõᵗʃõ, tʃɪtɪu:, d̲ɪdu, tɪtũ]
*12. (I) come (-ing, in)	12. [t̲ʌ:m, kəmɪi, əkumən]
13. cookie	13. [kukʰi, kuki, kɔki, kuki, kʰuki, kukʰi, kʰukʰiʰ, guki]
14. daddy	14. [d̲æd̲ɪ, tʰædʰɪ̃, dada, dædᶻ, dæda]
15. doo(gie)	15. [tʰækʰ, t̲æk, dɛuhi]
16. down	16. [dæ̃ʉ, dɛ̃un]
17. fall(ing) ~ fell	17. [fæo, fɔ, fə, fɔᶻn, fɔn]
18. feet ~ foot	18. [fi:tʰ, fu, ɸitᵊ]
19. flower	19. [favəˌ ᶠfæ-ə]
20. go (to)	20. [gɔ, goto]
21. good	21. [guᵈ]
*22. (I) got it	22. [ˀəgʰad̲dɪtʰ, ˀəgʰæɪ, ˀagaɪt̲]
23. gum	23. [gʰʌh]
*24. (I) had (it)	24. [ahaᶻ, axadət]
25. hands	25. [hɪts, hɪ:s̲]

Adult Model	Eileen's Word
26. here	26. [hiᵊ]
27. hello	27. [awo, ᵊwʌʊ, ᵊwʊo]
28. hi	28. [ʔæːɪ, haːɪ]
29. horsie	29. [ɔs̪i]
30. house	30. [xaʊ]
31. it's (a)	31. [ɪsə, ɨˢt̪]
**32. juice	32. [tʃʊʃ]
33. kiss	33. [kɪs, kɨs̪, kɨʃ]
34. kitty cat	34. [kʰitæ̰, kitaː, kˣɪtʰɪ, katɪ, kʰʊdɨ kʰæt̪ʰ, kɨd̪ɪ, kˣikʰə, kʰikatʰi]
35. look (at)	35. [wʊk, lɨk, ʔəkʰ, ʊk, ɨᵏkə̀, ɪkə, ɨkʰ, ɨgə]
36. man	36. [măn]
37. my (mine)	37. [mă, măɪ, mæːɪn, măɪn, maɪ, maᵀ, mai]
38. mm (good)	38. [m̩m]
39. mommy	39. [mami, mamɪ, mamɛɪ, mæːmɪ, mæmi]
40. more	40. [mɔ, mʊ]
41. nice	41. [naɪ, naɪs̪]
42. night-night	42. [næːtæː]
43. no	43. [nᵊʊ, naʊ, nʌʊ, nɛʊ]
44. ok	44. [kɛl, əkˣɛɪ, ʔʌkɛɪ, ʔækæᵀ, əkˣi]
45. on	45. [ɔn, ãn]
46. one	46. [wă, wān, wa, wən, ʷɔ̃n, wʌn]
47. other	47. [ʌdə, ʔaːdə, ʔadə, əd̪ʊ, ʔʊdə]
48. outside	48. [tʃaɪ, ʔaᵈʒə]
49. pants	49. [pʰeə, pātʃi, pʰɪtʃ, pætʃᵀ]
50. please	50. [pɪˡs, pʰɪːtʃ]

Adult Model	Eileen's Word
51. pop (lollipop)	51. [pa, pap]
52. put	52. [pø, p^{h}ʊ, pʊ̈, pə, pɔ]
53. right here	53. [wahi:ə, æɪthɨa, əhiə]
54. right there	54. [wadiɛ, waḍeə, waɪdiæ, ʔaɪdi:ə, ʔədɪɛ, ʔ wdeə, ʔaḍɪɛ]
55. see (=look)	55. [ʃi]
*56. (I) see	56. [ɪçi]
57. shoe(s)	57. [ʃiʊʃ, $ʃ^{j}_{t}$uʃ, tʃʊ, tʃu, $ʃ^{j}$uʃ, $ʃ^{j}$us, tʃɛ:u, ^{t}ʃus, $ʃɪ^{w}$s]
58. sit down	58. [ʃɪdæ̃ʊn, ʃida:, ʃid$_{ʌ}$, sʊdə̃n, ʃɪ̃dɪ̃]
59. Teddy (bear)	59. [dɛdɪ]
60. (tele)phone	60. [fΦʊn, $t^{h}{}_{ʌ}$f̃õ]
61. there	61. [deə, neə, $ḍ^{z}$i:ə, dɪə, ḍiɛ, d^{j}ə]
62. this	62. [dɪs̲, dɛʃ, tɪs, ḍɪs̲]
63. uh huh	63. [ə̃hʊ̃]
64. up here	64. [əpi:ə]
*65. (I) want	65. [wã:nt, wãt, əwæ̃, ^{ʔ}æ̃wæ̃, aɪ̃wãn]
66. why	66. [wæ:ɪ, wa:ɪ, waɪ]
67. yeah	67. [jɛ:, jəa]
68. yes	68. [jɛs, jæʃ, jæs]
69. yes-or-no (often used by mother)	69. [jɛtʃʊnʌ:ɾ, jɛə̃næʊ, jɛs nɛʊ]
70. you	70. [ju, ju:]

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